

Preliminary Evaluation Objectives

- Evaluate the safety at roundabouts in NC with at least 3 years of after period crash data.
- Determine if the total number of crashes at these intersections decreased after roundabouts were installed. If so, by how much?

Final Evaluation Objectives

Once the after period crash data is available for over 30 locations (not until 2010), we will provide a final report to:

- Determine if the total number of crashes at all intersections statewide decreased after roundabouts were installed.
- Determine if the severity of crashes decreased after roundabouts are installed.
- Determine which crash types experienced a decrease (or increase) after roundabouts are installed.

34 roundabout locations statewide at the time the preliminary report was completed (9/07).

All locations built between 1999-2006.

Several locations under private jurisdiction were removed from the list because we could not obtain crash data.

For the preliminary evaluation, 14 locations available with at least 3 years of after period crash data (those completed 1999-2003)

Locations For Preliminary Evaluation: Greater Than Three Years of After Period Crash Data Available

Built	Built Div County Municipality		Municipality	Location	Jurisdiction	Description	
1999	9	Forsyth	Clemmons	Fraternity Church at Hope Church	State	New School Drive	
2000	5	Durham	Durham	Washington at Glendale	Muni	Modified Circle, Part of I-85 Detour Route	
2000	9	Forsyth	Lewisville	Williams at US 421 SB Ramps	State	Solved Capacity Problem	
2000	10	Mecklenburg	Charlotte	Ninth at Davidson	Muni		
2001	2	Craven	New Bern	Broad at E. Front *	State	Part of Enhancement Project	
2001	9	Forsyth	Winston-Salem	Westview at Buckingham	Muni	City - Possible Traffic Calming Location	
2002	9	Davie	Advance	NC 801 at I-40 EB Ramp	State	Developer - "Temporary" Intersection Fix	
2002	9	Forsyth	Bethania	Turfwood at Long Creek *	State	Developer	
2002	9	Forsyth	Lewisville	Styers Ferry at Utility	State		
2002	11	Wilkes		Yellowbanks at Haymeadow	State	Spot Safety	
2002	13	Buncombe	Asheville	Lake at Mountain	State	Developer	
2002	13	Buncombe	Asheville	WT Weaver at University Heights	State	City / University Project	
2003	1	Dare	Kill Devil Hills	Veterans at Sixth *	Muni	Built For New High School Drive	
2003	5	Durham	Durham	NC 751 at Old Erwin	State	Spot Safety	
2003	5	Wake	Raleigh	Pullen at Stinson	Muni		
2003	9	Forsyth	Lewisville	Williams at US 421 NB Ramps	State	"Mirror" Image Of Other Ramp	
2003	10	Mecklenburg	Charlotte	Park at Tremont	Muni	City - Possible Traffic Calming Location	

^{*}Could not evaluate due to the addition (or removal) of an intersection leg in the after period.

14 locations were Divided into 3 Groups By Intersection Characteristics:

Group 1: Mainline Speed Limit at or Below 35 mph and Stop Sign Control in the Before Period

Group 2: Mainline Speed Limit Above 35 mph and Stop Sign Control in the Before Period

Group3: Signalized Control in the Before Period (Only One Location)

14 locations were Divided into 3 Groups By Intersection Characteristics:



LOCATION MAP: Roundabout Locations for Preliminary Evaluation

- Group 1. Seven Locations with Mainline Speed Limit At or Below 35 mph (Prior Control Stop Sign)
- Group 2. Six Locations with Mainline Speed Limit Above 35 mph (Prior Control Stop Sign)
- Group 3. One Location with Mainline Speed Limit At or Below 35 mph (Prior Control Signal)

Results: Group 1

Mainline Speed Limit At or Below 35 mph (Prior Control – Stop Sign)

Naïve Before and After Analysis: 41% (+/- 14%) reduction in total crashes

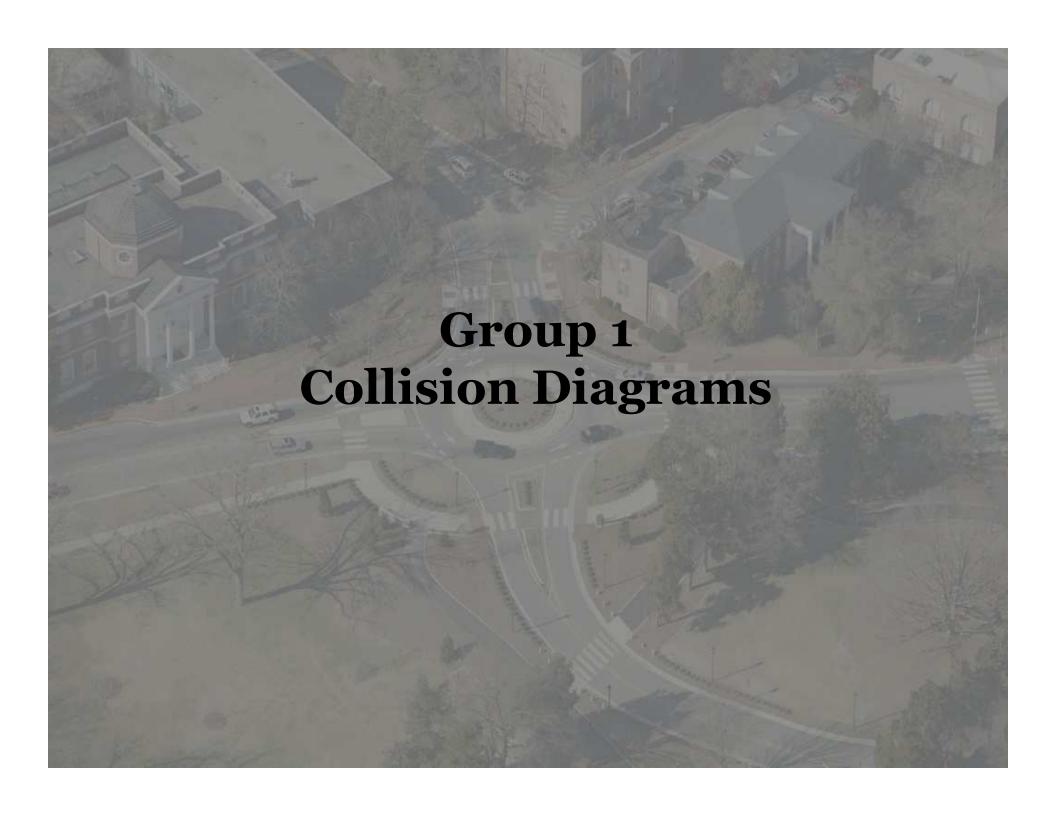
Before and After Analysis With Consideration for Traffic Increase: 54% (+/- 11%) reduction in total crashes

Group 1. Mainline Speed Limit At or Below 35 mph (Prior Control - Stop Sign)

TABLE 3. GROUP 1 CRASH DATA							Before		After	Percent Increase (+)/
Div	County	Municipality	Location	Built	Years	AADT	Total Crashes	AADT	Total Crashes	Percent Decrease (-)
5	Wake	Raleigh	Pullen at Stinson	2003	3,17	11000	12	12500	3	-75.0%
10	Mecklenburg	Charlotte	Park at Tremont	2003	3,17	7200	4	6000	4	0.0%
5	Durham	Durham	Washington at Glendale	2000	6,17	5500	4	5500	5	25.0%
9	Forsyth	Winston-Salem	Westview at Buckingham	2001	5.17	7400	6	6000	0	-100.0%
13	Buncombe	Asheville	WT Weaver at University Heights	2002	4,17	3000	10	3800	3	-70.0%
9	Davie	Advance	NC 801 at I-40 EB Ramp	2002	4.17	9000	12	16800	13	8.3%
13	Buncombe	Asheville	Lake at Mountain	2002	4.17	2000	0	2400	1	N/A

 \sum Before = 48

 \sum After = 29

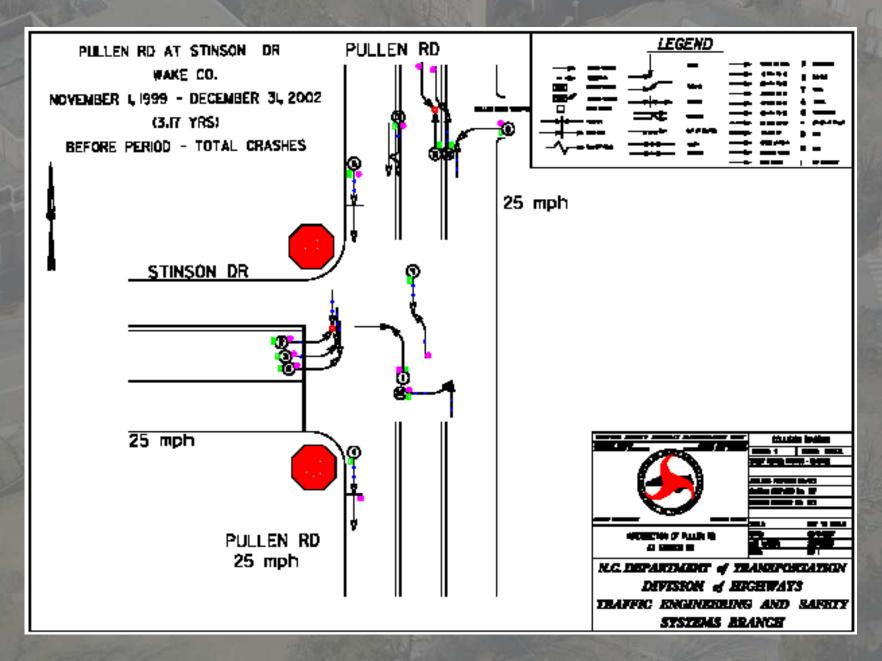


Pullen at Stinson - Raleigh

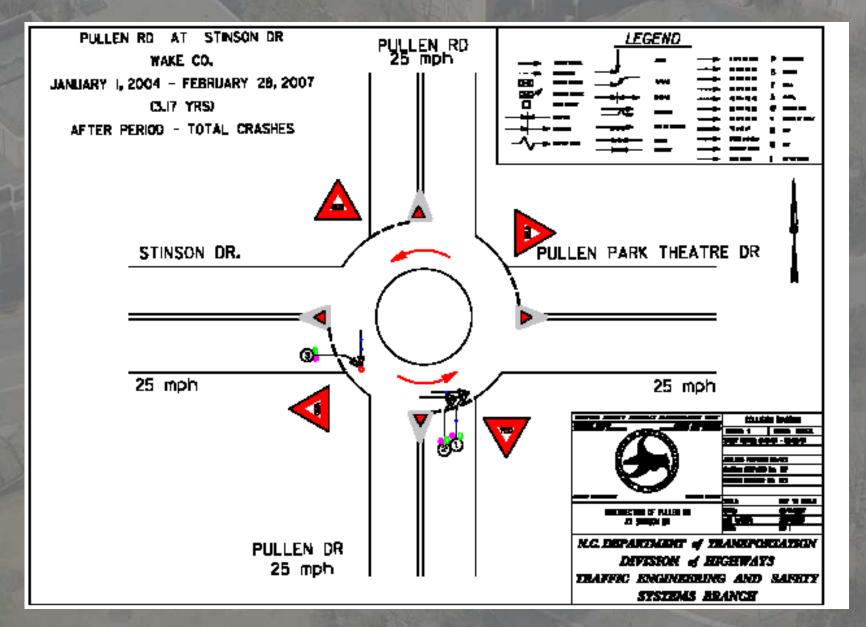




Pullen at Stinson – Before Period



Pullen at Stinson – After Period

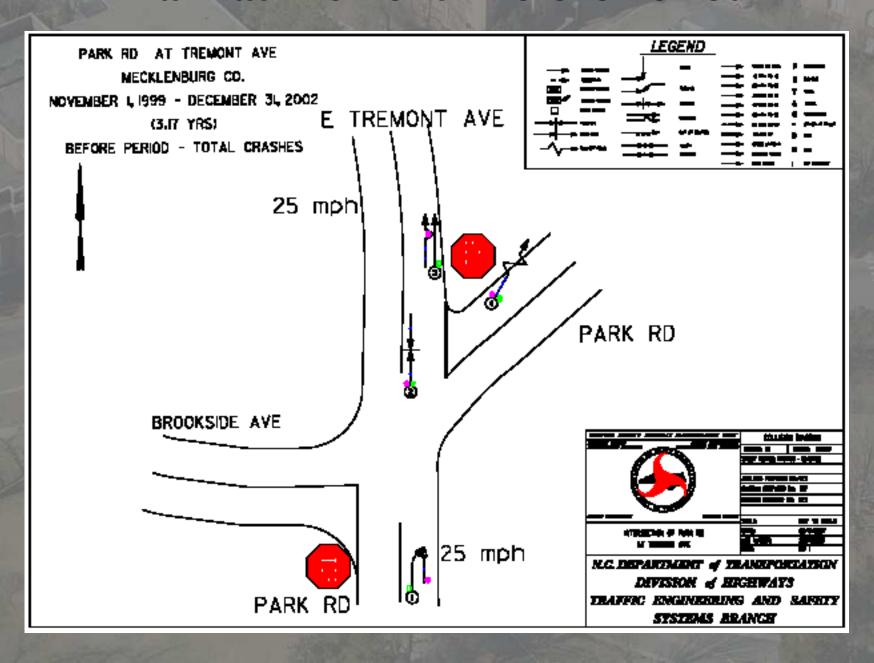




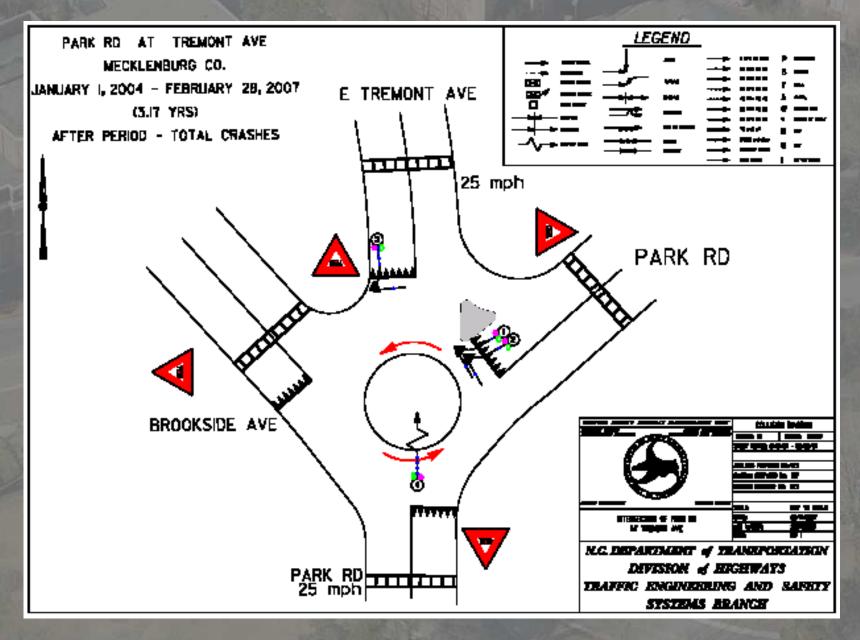




Park at Tremont-Before Period



Park at Tremont-After Period

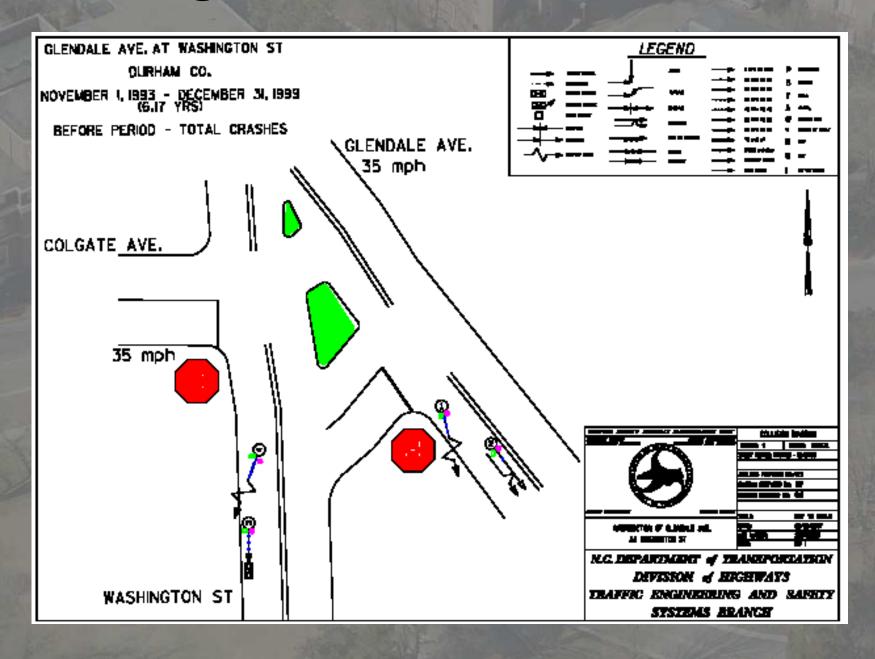


Washington at Glendale - Durham

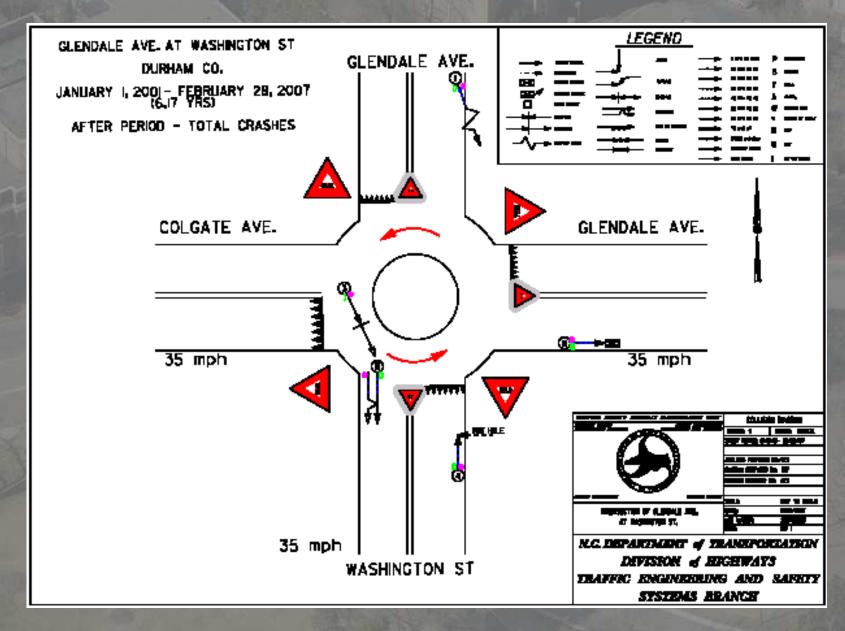




Washington at Glendale-Before Period



Washington at Glendale-After Period

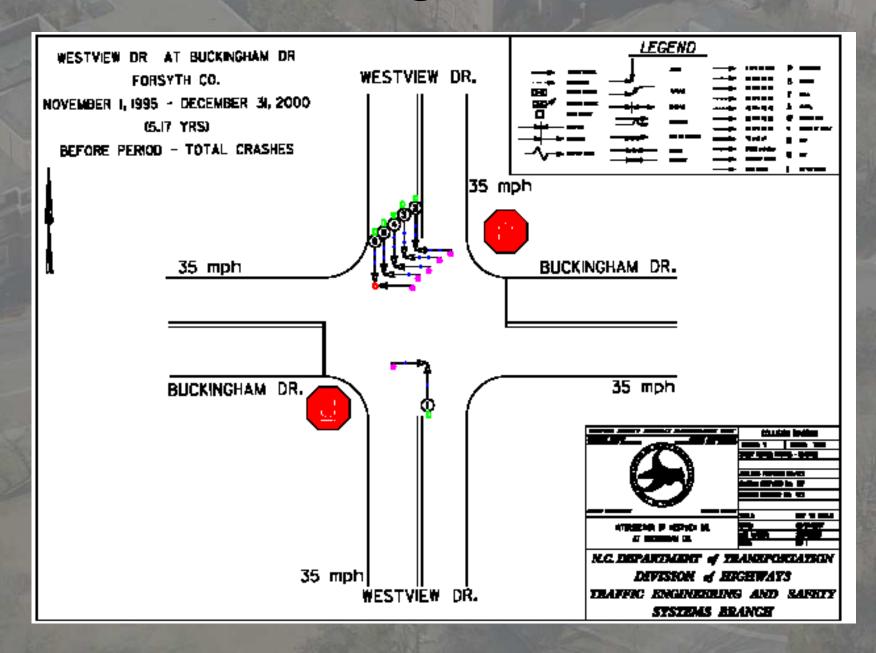


Westview at Buckingham – Winston-Salem

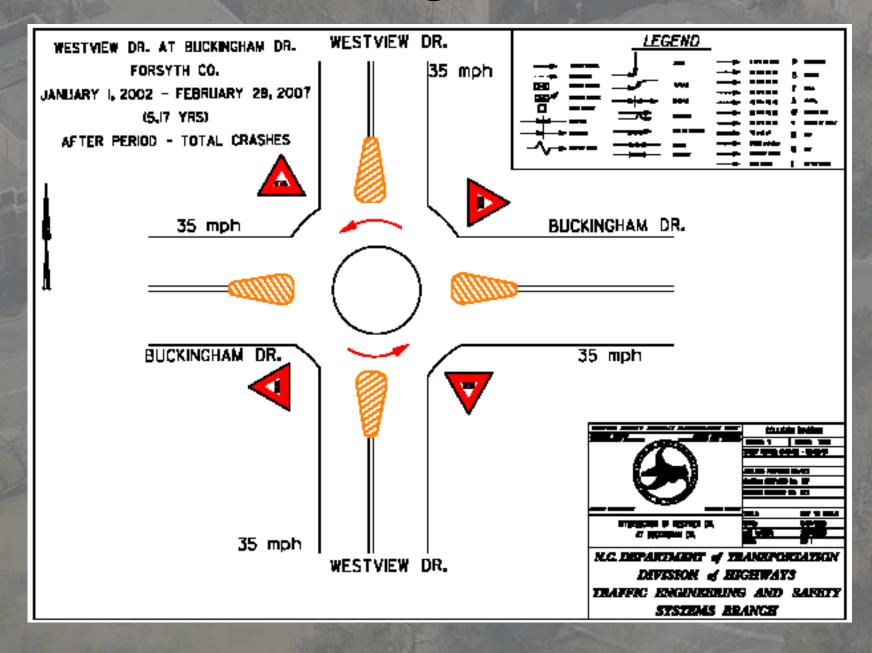




Westview at Buckingham-Before Period



Westview at Buckingham- After Period

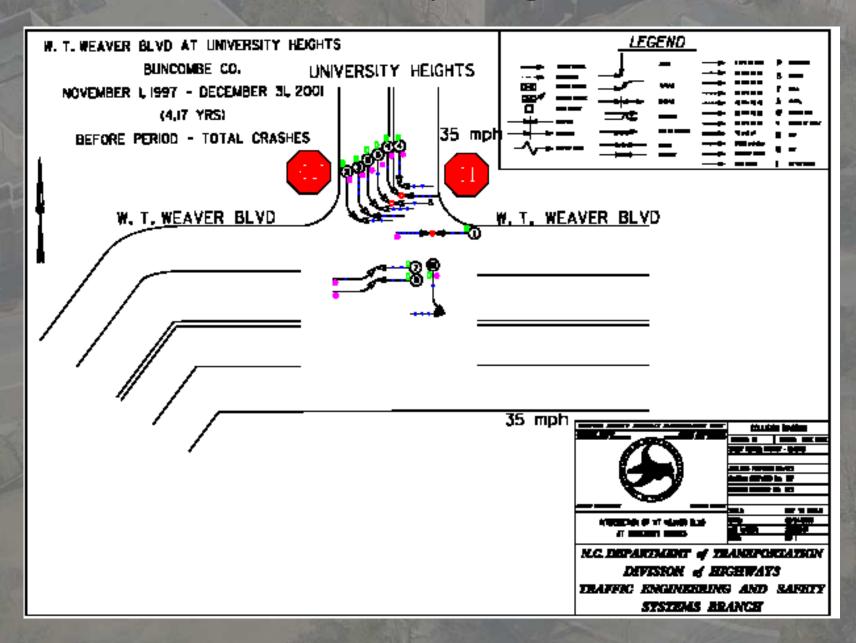


WT Weaver at University Heights - Asheville

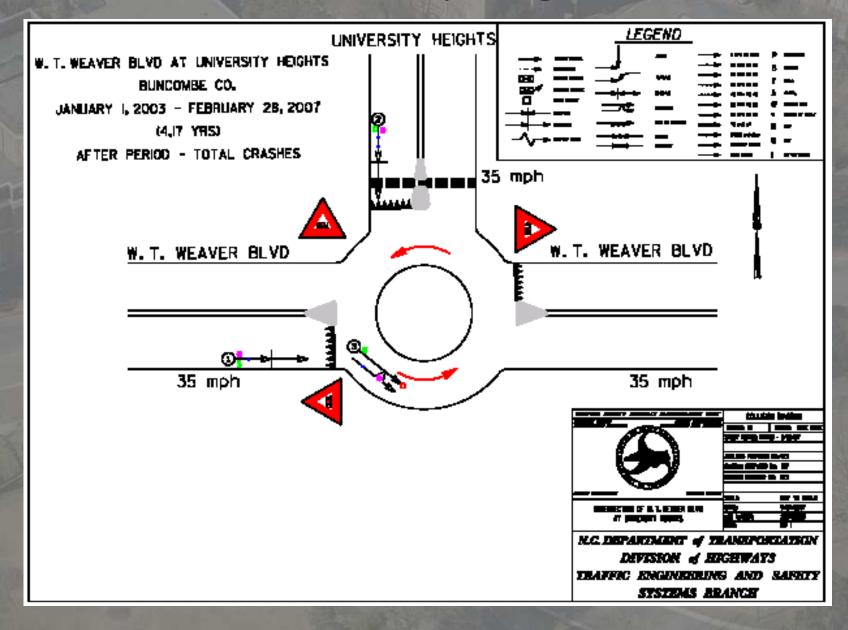




WT Weaver at University Heights-Before Period



WT Weaver at University Heights- After Period

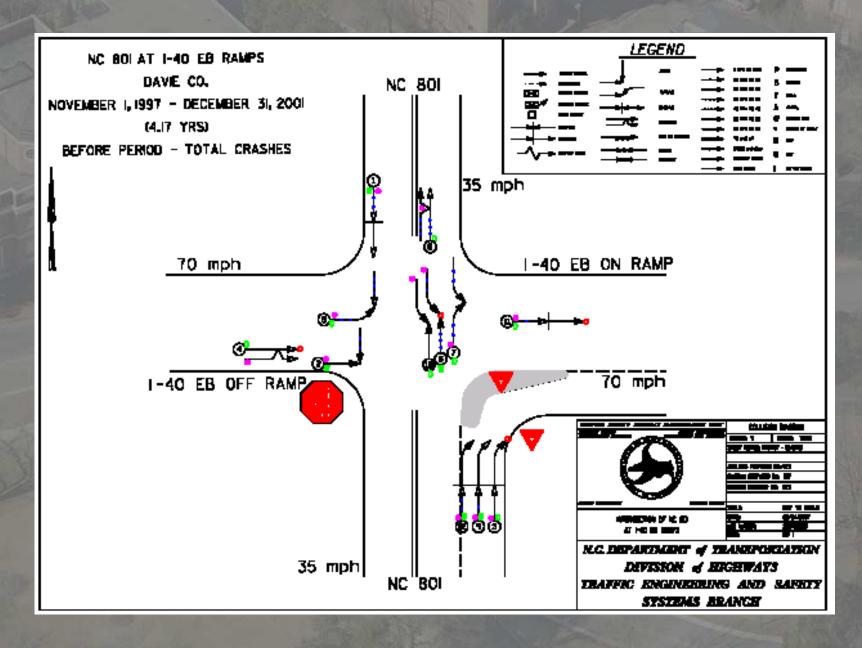


NC 801 at I-40 EB Ramp - Advance

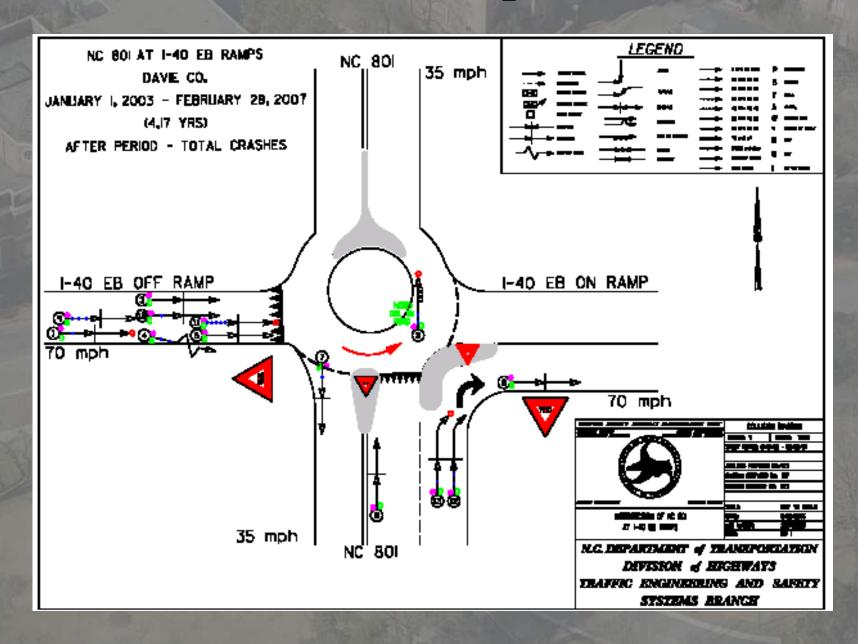




NC 801 at I-40 EB Ramp-Before Period



NC 801 at I-40 EB Ramp- After Period

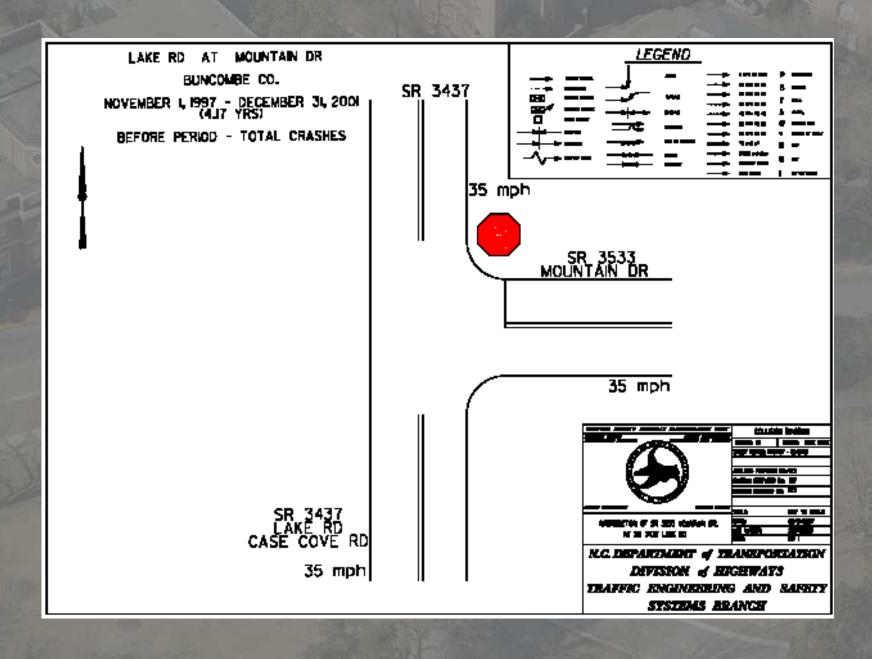




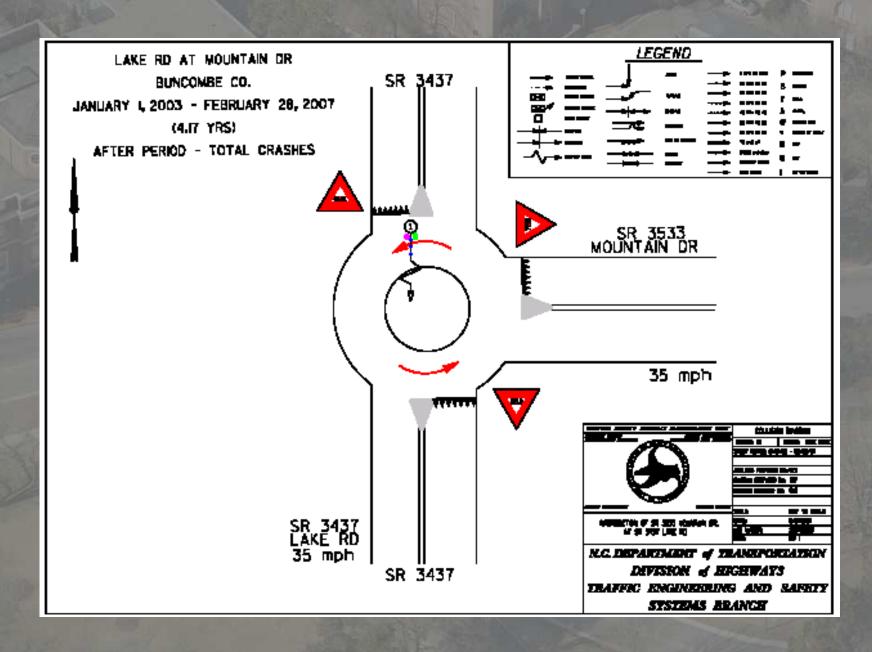




Lake at Mountain-Before Period



Lake at Mountain-After Period



Results: Group 2

Mainline Speed Limit Above 35 mph (Prior Control – Stop Sign)

Naïve Before and After Analysis: 47% (+/- 15%) reduction in total crashes

Before and After Analysis With Consideration for Traffic Increase: 48% (+/- 15%) reduction in total crashes

Group 2. Mainline Speed Limit Above 35 mph (Prior Control - Stop Sign)

TABLE 6. GROUP 2 CRASH DATA							Before		After		Percent Increase (+)/
	Div	County	Municipality	Location	Built	Years	AADT	Total Crashes	AADT	Total Crashes	Percent Decrease (-)
	9	Forsyth	Lewisville	Styers Ferry at Utility	2002	4,17	4500	2	5000	2	0.0%
	9	Forsyth	Lewisville	Williams at US 421 SB Ramps	2000	6,17	12900	11	14200	3	-72,7%
	9	Forsyth	Lewisville	Williams at US 421 NB Ramps	2003	3.17	12500	4	13600	6	50.0%
	5	Durham	Durham	NC 751 at Old Erwin	2003	3.17	16100	14	15600	2	-85,7%
	9	Forsyth	Clemmons	Fraternity Church at Hope Church	1999	7.17	2200	0	4400	2	N/A
	11	Wilkes	_	Yellowbanks at Haymeadow	2002	4,17	3600	4	2900	4	0.0%

$$\sum$$
 Before = 35

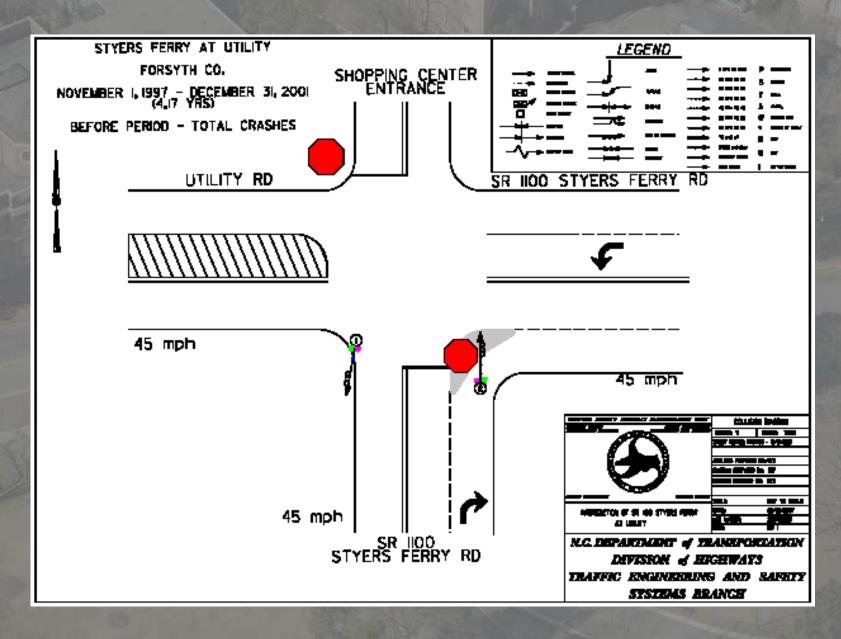




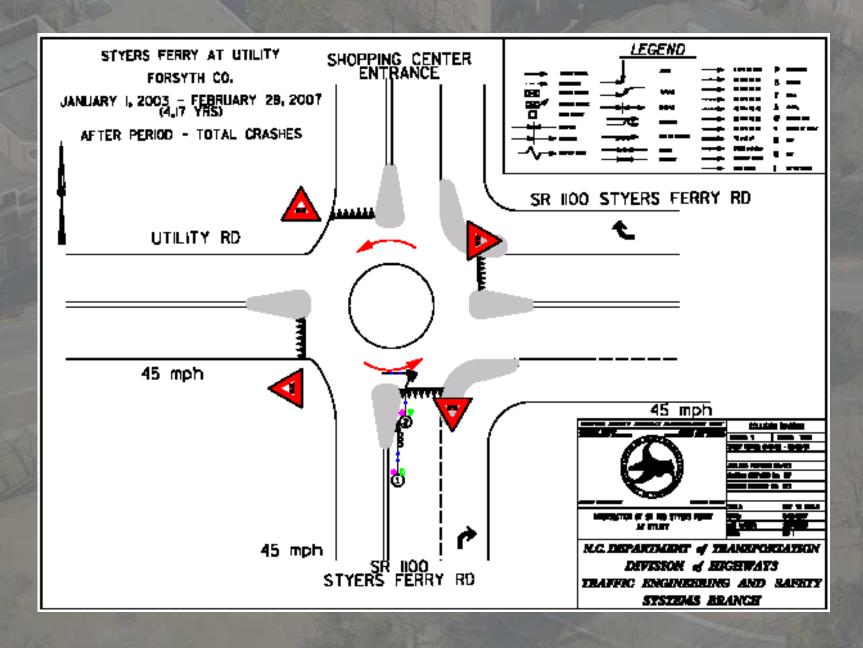




Styers Ferry at Utility - Before Period



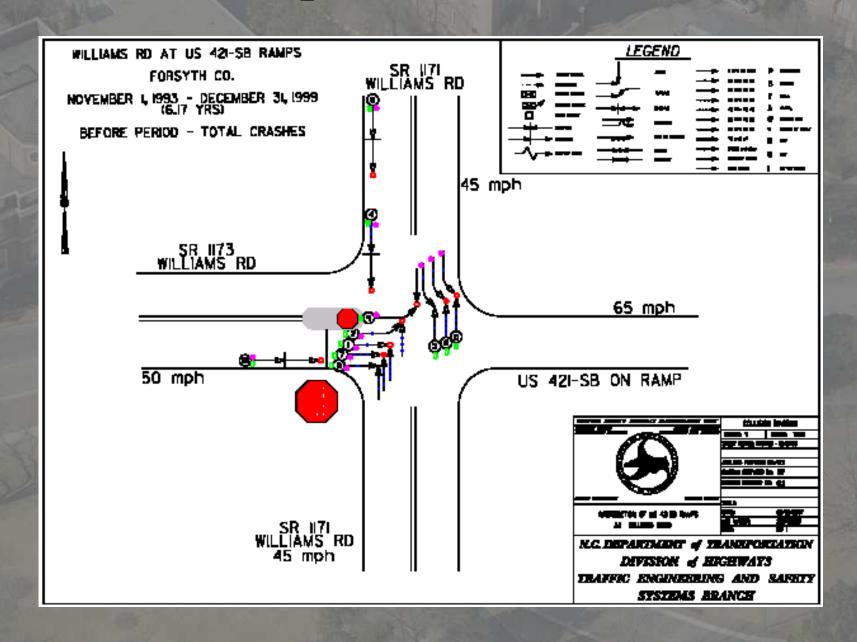
Styers Ferry at Utility – After Period



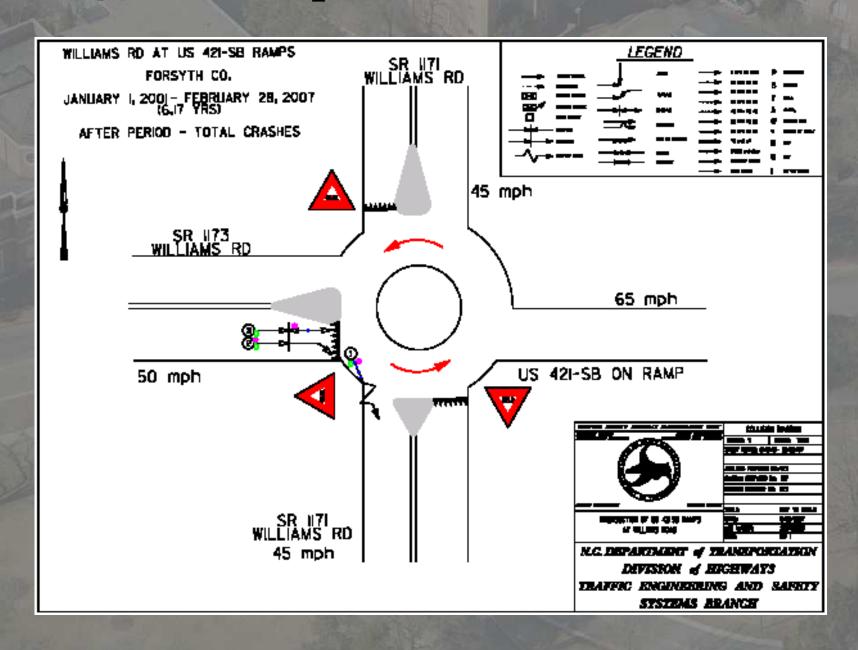
US 421 SB Ramps at Williams - Lewisville



US 421 SB Ramps at Williams – Before Period



US 421 SB Ramps at Williams – After Period

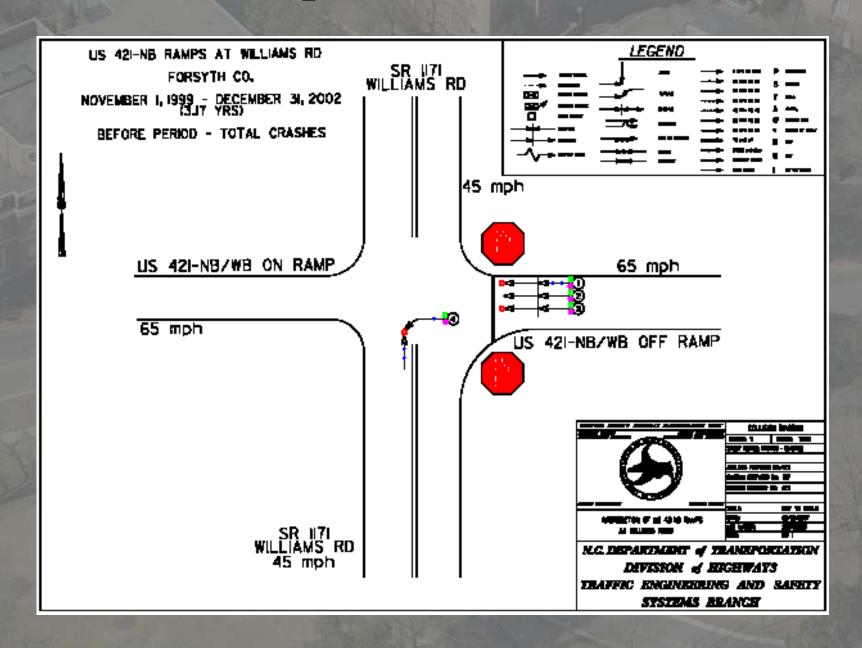


US 421 NB Ramps at Williams - Lewisville

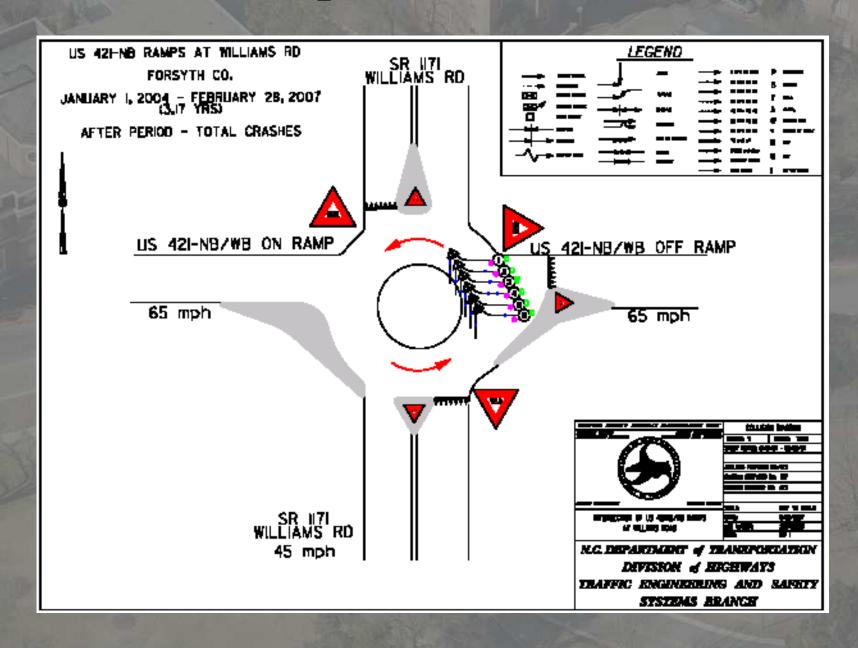


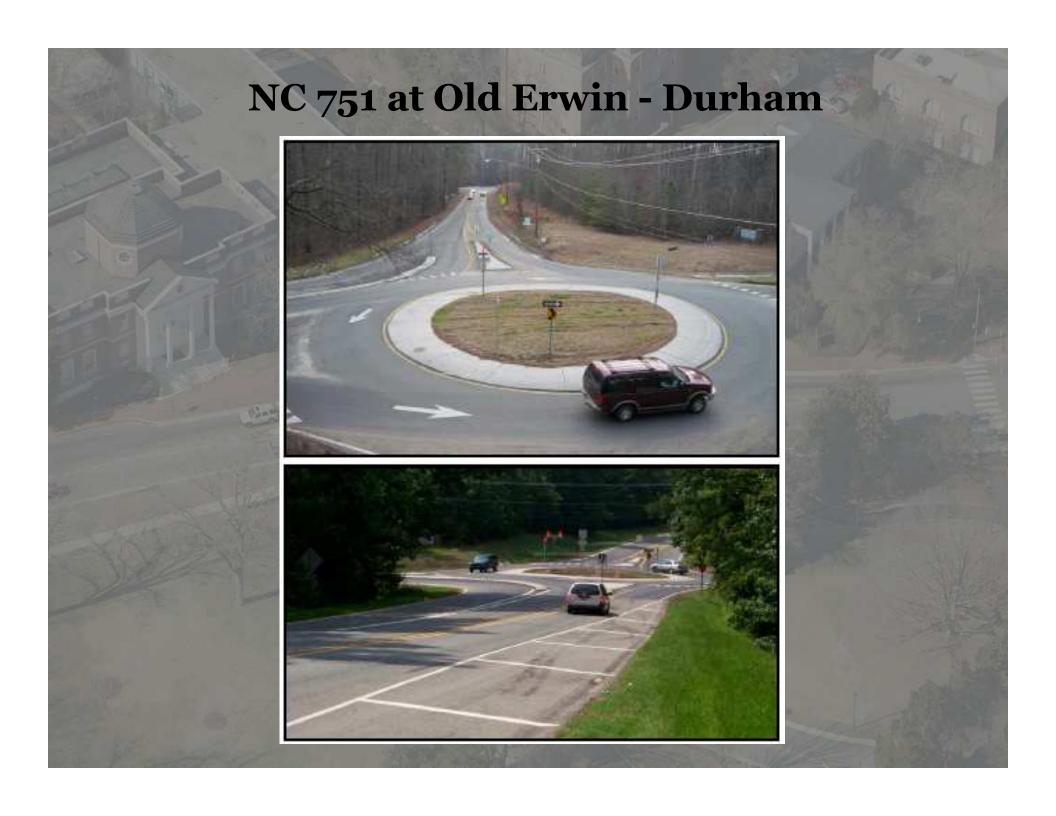


US 421 NB Ramps at Williams - Before Period

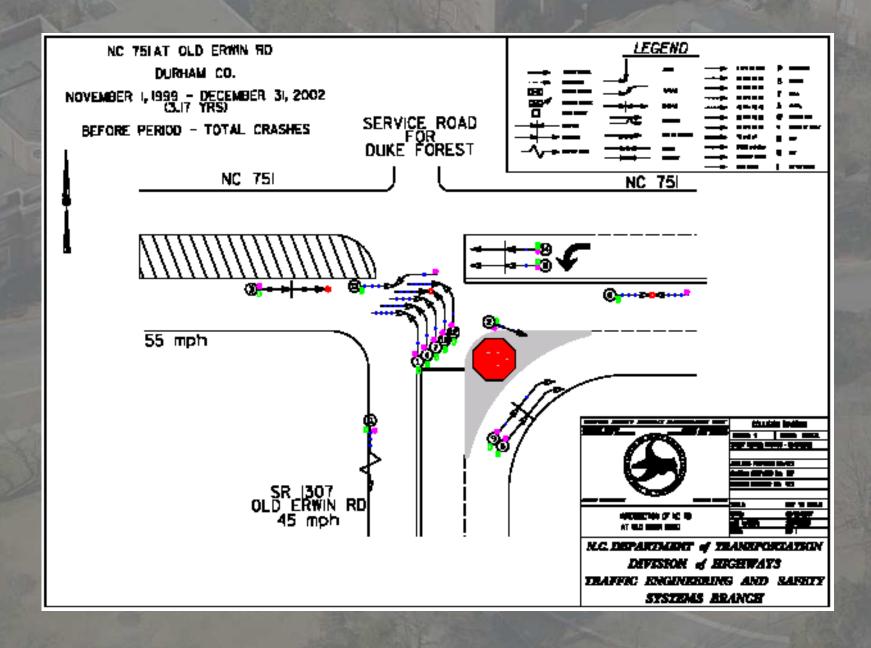


US 421 NB Ramps at Williams – After Period

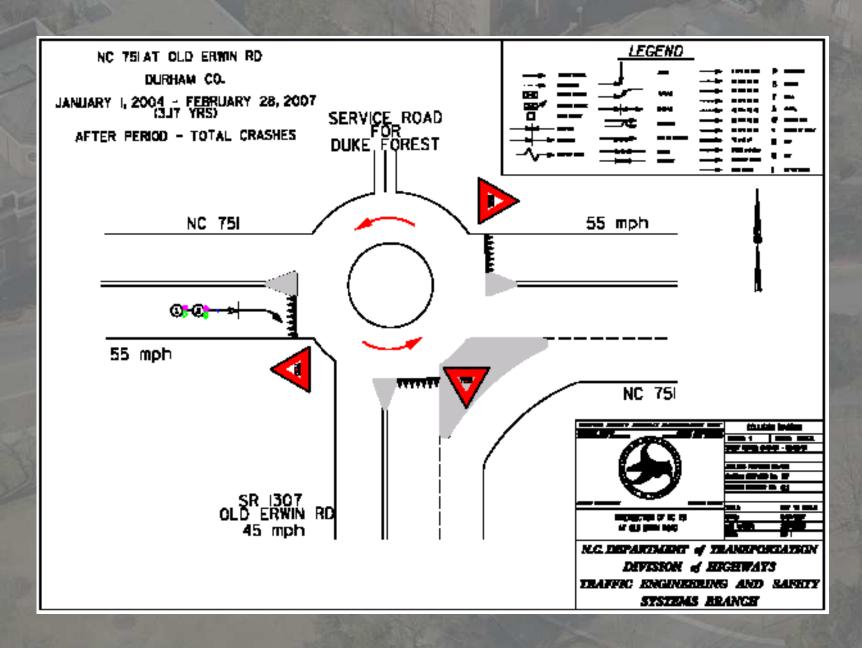




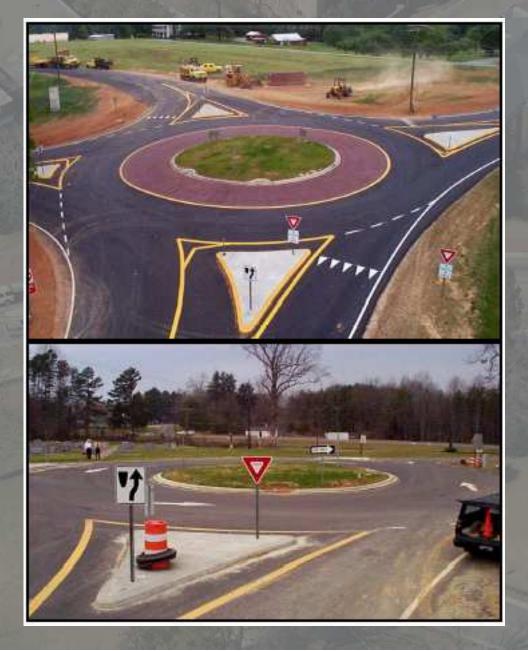
NC 751 at Old Erwin - Before Period



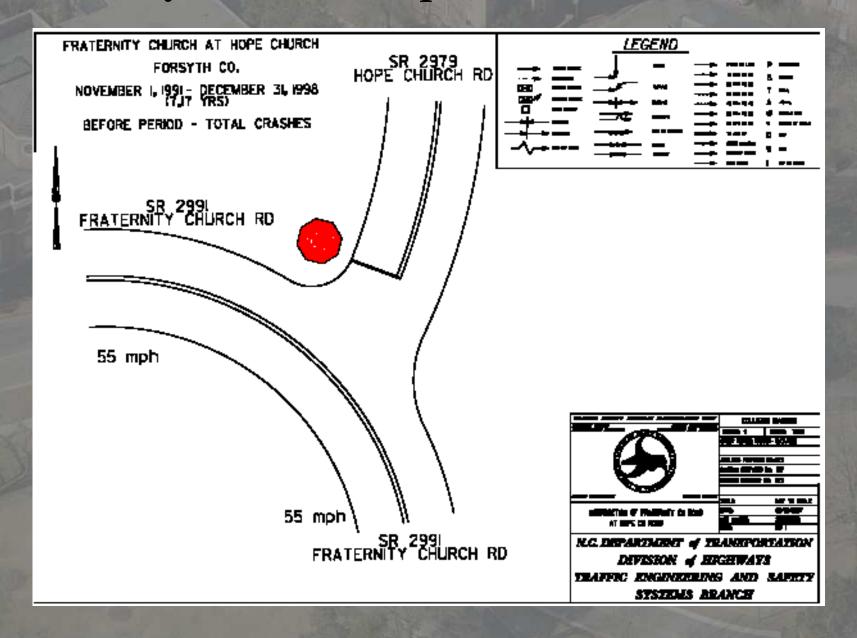
NC 751 at Old Erwin – After Period



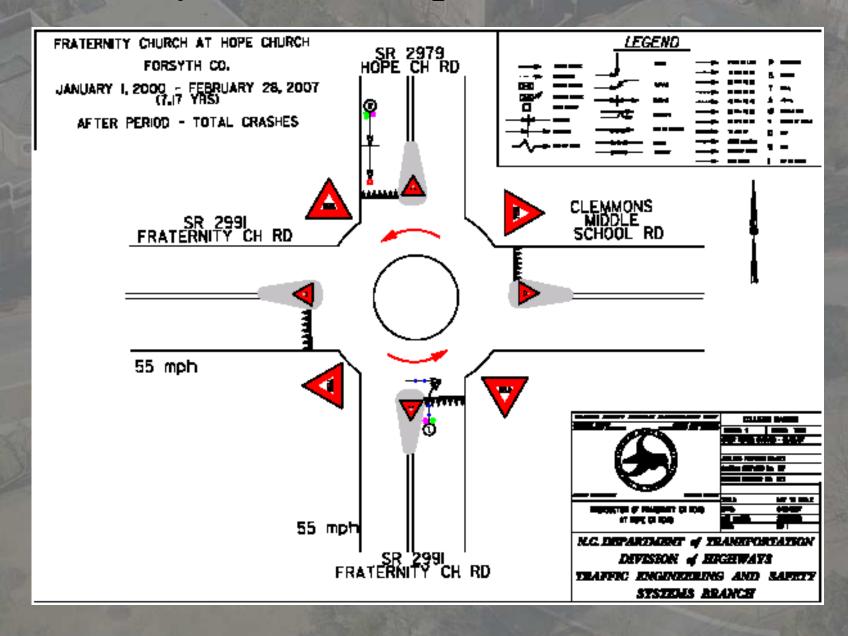
Fraternity Church at Hope Church - Clemmons



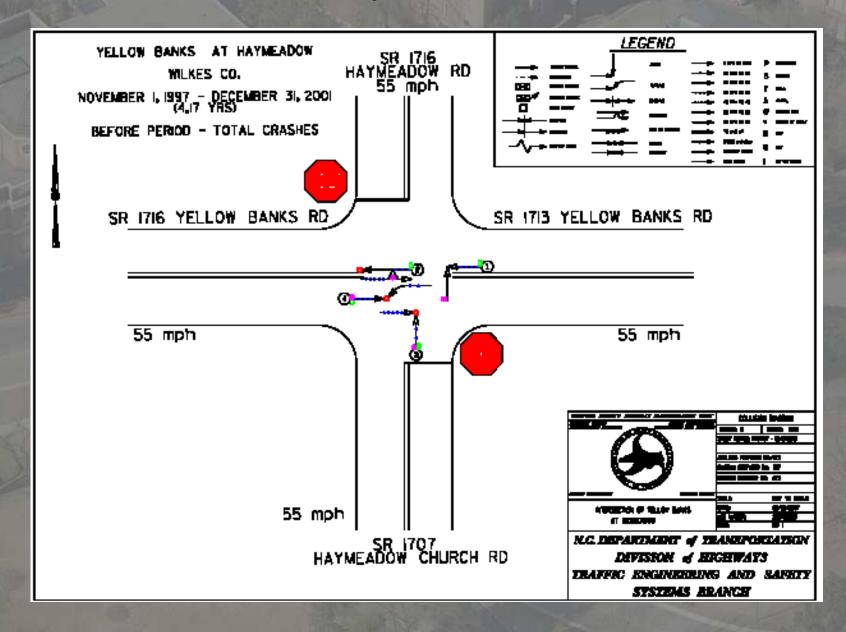
Fraternity Church at Hope Church – Before Period



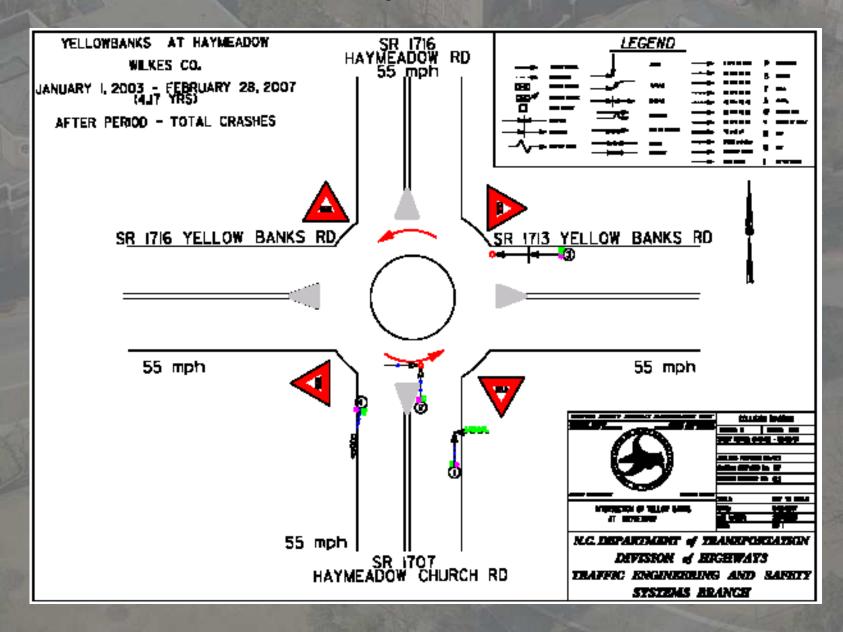
Fraternity Church at Hope Church – After Period



Yellowbanks at Haymeadow - Before Period



Yellowbanks at Haymeadow – After Period



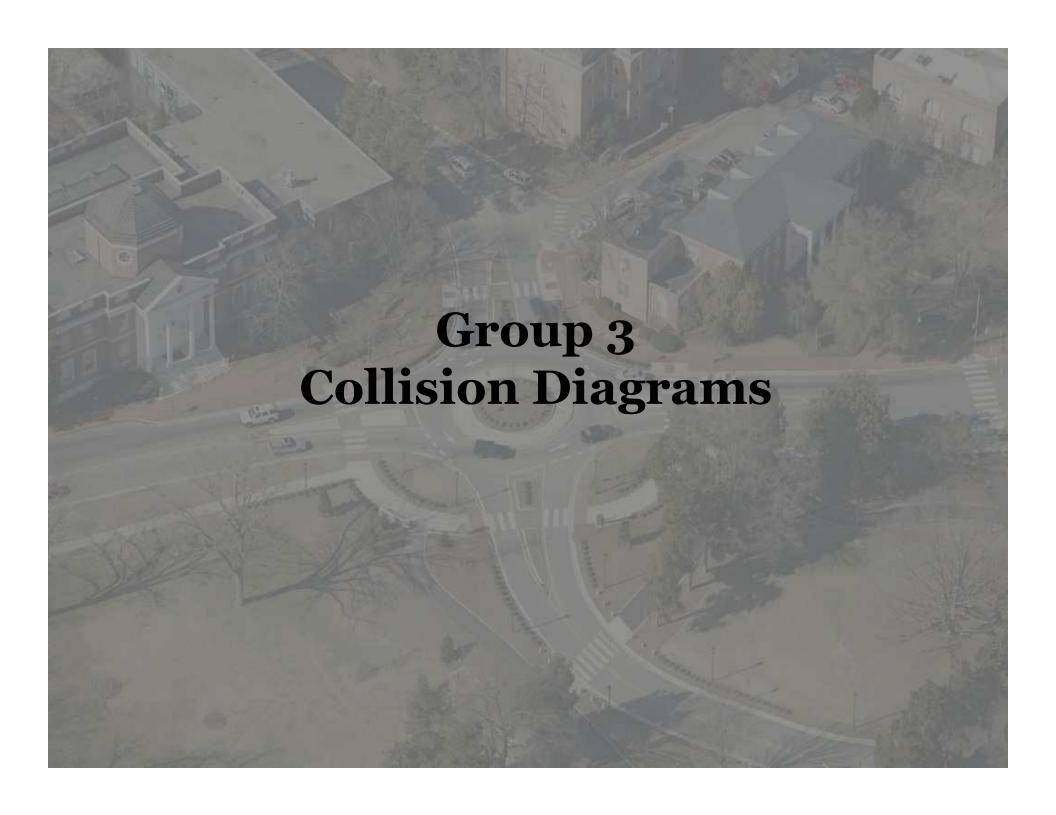
Results: Group 3

Mainline Speed Limit At or Below 35 mph (Prior Control – Signal)

74% reduction in total crashes

Group 3. Mainline Speed Limit At or Below 35 mph (Prior Control - Signal)

TABLE 9. GROUP 3 CRASH DATA							Before		After		Percent Increase (+)/
I	Div	County	Municipality	Location	Built	Years	AADT	Total Crashes	AADT	Total Crashes	Percent Decrease (-)
	10	Mecklenburg	Charlotte	Ninth at Davidson	2000	6,17	20500	31	19500	8	-74.2%

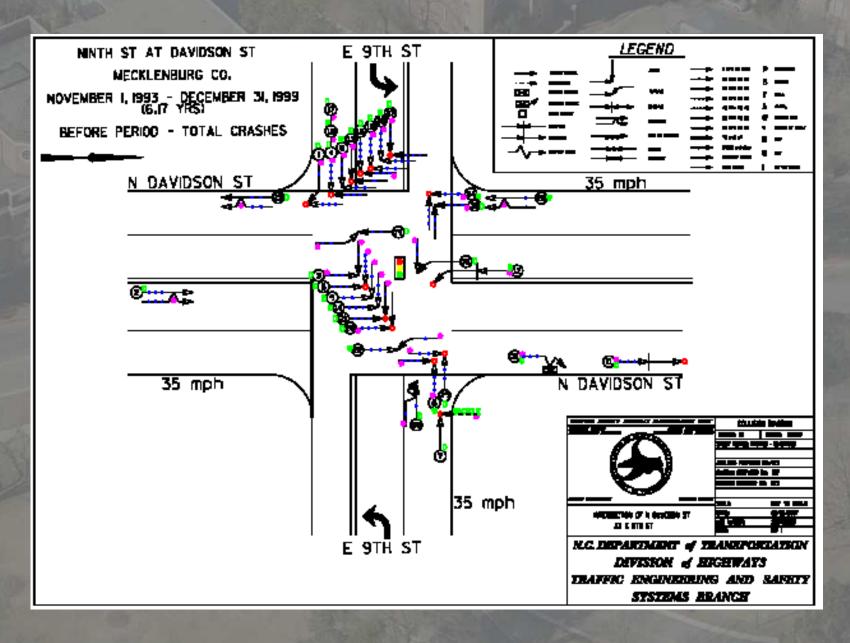




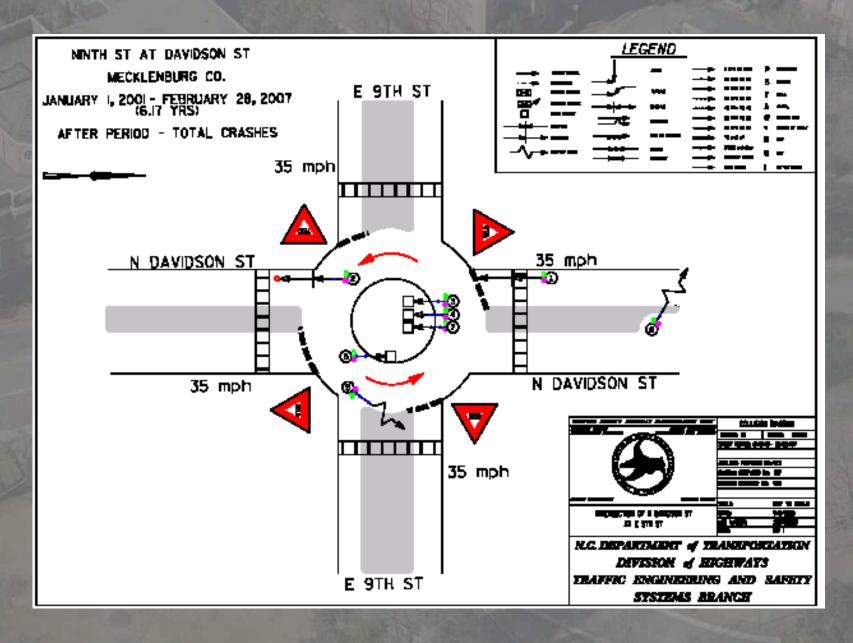




Ninth at Davidson - Before Period



Ninth at Davidson-After Period



Conclusions

Preliminary results demonstrate that all three groups of roundabout locations appear to have had a substantial reduction in the frequency of crashes from the before to the after period.

The evaluation will be updated when there is at least 3 years of after data available at the remaining locations, so a more concrete conclusion can be drawn. At that time we will be able to provide more objective and definite information regarding actual crash reduction factors.

